INSTITUTE OF PUBLIC HEALTH
COLLEGE OF MEDICINE AND HEALTH SCIENCE
UNIVERSITY OF GONDAR

WORK RELATED INJURIES AND ASSOCIATED FACTORS AMONG TENDAHO SUGARCANE PLANTATION WORKERS IN AFAR REGION, ETHIOPIA

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Examiner

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Acronyms

AJIM	American Journal of Industrial Medicine
AJPH	American Journal of Public Health
ANRS	Afar National Regional State
AOR	Adjusted Odds Ratio
CI	Confidence Interval
COR	Crude Odds Ratio
ETB	Ethiopian Birr
FDRE	Federal Democratic Republic of Ethiopia
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
IJESM	International Journal of Engineering, Science and Metallurgy
IJOSE	International Journal of Occupational Safety and Ergonomics
ILO	International Labor Organization
MOFED	Ministry Of Finance and Economic Development
NASS	National Agricultural Statistics Service
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment
SD	Standard Deviation
SHARP	Safety and Health Assessment and Research for Prevention
SPSS	Statistical Package for Social Science
TVET	Technique and Vocational Education and Training
UNFPA	United Nation Population Fund
US	United States
WHO	World Health Organization

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Abstract

Background: According to International Labour Organization 2012 estimation, globally about 2.34 million workers died from work related injuries. Based on the same statistics, around 6300 work force were died and 850,000 workers were injured daily. Therefore the result of this study - may helps to contribute in filling information gaps on the existing occupational health and safety service practices in the work environments.

Objective: To assess work related injuries and associated factors among Tendaho Sugarcane plantation workers, in Afar region, Ethiopia.

Methods: Institution based cross sectional study was conducted from March/2014 to April/2014, in Afar region, Ethiopia. A total of 654 workers were involved in the study. Stratified sampling technique was used , and the data were collected by using pretested questionnaire and walk through survey using work environment observation checklist. The data were coded and entered in to SPSS version 16 for analysis. Descriptive, Bivariate and Multivariate analysis was done and displayed using tables, charts, graphs and text.

Results: The overall one year work related injury prevalence was 77.5%. Age between 18 - 29 years [AOR:2.603,95%Cl;(1.432-4.731], being never married [AOR:3.314 ,95%Cl; (1.700-6.464)], educational status of elementary school and below [AOR:3.948, 95%Cl;(1.814 - 8.593)], alcohol drinking [AOR:2.610, 95%Cl;(1.574-4.327], chewing khat [AOR: 8.467 , 95%Cl;(4.696 -15.267)] and sleeping disorders [AOR:8.675, 95%Cl; (3.776 - 19.932)] were significantly associated factors for the occurrence of work related injuries.

Conclusion and recommendations: The prevalence of work related injuries were high. Age, educational status, marital status, drinking of alcohol, khat chewing and sleeping disorders were significant factors for the occurrence of work related injuries. Therefore, establishing and implementing occupational health and safety management system, controlling workplace hazards, provision of personal protective equipment and providing training about significant factors can prevent workers from injury.

Key words: Work related injuries, prevalence, Tendaho sugarcane plantation**,** sleeping disorders.

1. Introduction

1.1. Statement of the problem

An occupational injury is any physical injury sustained on a worker in connection with the performance of his or her work in the industry . Workers in industries spend at least one third of a day at work which have a strong effect on their health and safety. These occupational injuries pose a major public health and developmental problems which result in a serious health, social, and economic consequences on workers and their employers (1-4).

An estimated 2.34 million people die each year from work-related accidents and diseases. With regard to non-fatal injuries more than 317 million employees are getting injured at work which makes it to be above 850,000 workers when equated on daily basis. Concerning the disaggregation of the burden on global basis African continent accounts to about 46,561,176 which is about 15 percent, the figure which could be by far more than this if high under-reporting had not been prevailing among the nations of the continent (5). With regards to the situation of working conditions in developing countries, It is only 5 to 10 percent of the workforce in developing countries have access to occupational health and safety services (6).

The Global Burden of Injury and disease by WHO/World Bank estimated that 5% of the burden is attributed to work in established market economies. This may be also close to the loss of global GDP caused by work-related factors that the ILO earlier estimated to be 4% (7).

An estimate of 1.3 billion workers is engaged in agricultural production worldwide. This represents half of the total world labor force. Only 9% of agricultural workers are in industrialized countries. 74% of agricultural workers are found in Asia and Pacific, 16% found in Africa, 3% in Latin America and the rest found in industrialized and transition countries (8).

Agriculture and agro processing industries are one of the most hazardous occupations worldwide. In several countries the fatal accident rate in agriculture is double the average for all other industries. According to ILO estimates, workers suffer 250million accidents every year. Out of a total of 335,000 fatal workplace

accidents worldwide. There are some 170,000deaths among agriculture workers. The intensive use of machinery and pesticides and other agro chemicals has raised the risks (8).

Sugar industry is one of the major agro-based industries which play a vital role in the development of the country. The workers on industrial as well as agricultural sectors suffer different kind of injuries and illnesses due to poor working environment. These figures vary from minor injuries to more severe and fatal injuries. There is also a fundamental but un-quantified rate of pain; stress and exclusion from social responsibilities are the major outcomes of injury in sugar industries.

There was a study conducted in the study area by the year 2006 on the assessment of Occupational injuries and associated factors. But during that period the company is totally agricultural organization and their product is cotton, whereas know the company is transferred to sugar factory by the regulation no_122/2006. Sugarcane plantation & breeding of sugarcane seeds was started by the year 2010 and the factory will starts to produce sugar in the near future.

The number of workers is much greater than the earlier. During the transformation of the company from agriculture to agro based industry it includes Aysaita District which is not studied before.

According to a study conducted in Vietnam on the potential impact of injury rates during the transition from agriculture work patterns to combining agricultural work with new types of work. Jobs in the newer manufacturing industries were more dangerous than those in agriculture. Agricultural work modifies the risk of injury in manufacturing industrial works (9).

According to the FDRE GTP Sugar and sugar related industries are one of the three major macro economic development plan of the country, that promote the country to the middle income countries (10). This objective should be achieved through promotion of workplace health and safety and productivity.

1.2. Literature review

1.2.1. Prevalence of work related injuries

According to ILO's 2012 estimation, globally about 2.34 million workers died from work related injuries. Based on the same statistics, around 6300 work force is died every day due to occupational related causes. With regard to non-fatal injuries more than 317 million employees are getting injured at work which makes it to be above 850,000 workers when equated on daily basis. Concerning the disaggregation of the burden on global basis African continent accounts to about 46,561,176 which is about 15 percent ,the figure which could be by far more than this if high under-reporting had not been prevailing among the nations of the continent (5) With regards to the situation of working conditions in developing countries, the majority of the workers in these countries work in conditions where fundamental safety and health standard is not put in place. It is only 5 to 10 percent of the workforce in developing countries have access to occupational health and safety services (6).

The World Health Organization predicts that by the year 2020, injuries will be responsible for more death, morbidity, and disability than all communicable diseases combined. Currently, injuries account for 1 in 7 potential life-years lost worldwide, but by 2020 they will account for 1 in 5, with the developing countries bearing the brunt of this increase. During the last decade of the 20th century, workers in the US agriculture industry received particular attention because of the high risk of fatal injuries and suspected risk for serious nonfatal injuries (11)**.**

According to United States Department of Agriculture /USDA/ report by the year 2009 the total number of agriculture based work related injuries among youth under 20 years old workers are 15,876 injuries which is 7.2 injuries per 1000 farms (12).

The 2012 United States, bureau of labor statistics, department of labor report revealed that agricultural industries recorded highest rate of fatal injuries which 21.2 per 100,000 full time equivalent /FTE/ workers (13).

A 2011 study in Paraguay sugarcane plantation on injury prevalence among child workers revealed that, child workers carried out their work with dangerous tools, such as machetes and knives while exposed to extreme weather conditions. The

prevalence of work related injuries among child workers were 25.7%, during the observation 1 month period one in three child workers were injured at work (14).

In Iran a study was conducted in Iranian sugar producing factory by the year 2007, the prevalence of work related musculoskeletal disorders are 87.1% where as the highest injured body part registered was knee injury which is 58.6% (15)**.**

In India, a study was conducted on ergonomics and occupational health and safety problems of workers in 50 sugar mill factories showed that 48% of workers suffered from low back pain, 38% fatigue, 34% upper body pain, 50% stress and 54% were suffered from dissatisfaction(16). The 2012 Pakistan sugar industries survey revealed that, the prevalence of work related injuries were 437/1000 workers (17).

A study conducted in Malaysia by the year 2013 on fatal work related injuries among industries showed that agriculture, wood product and non metallic industries are the second highest rate of fatal injuries which is 30.5 per 100,000 workers (18).

The study carried out in Brazil showed that there was an incidence of 56 per 1000 exposed workers per year (19).

In Ethiopia even though there is a scarcity of data on nationwide researches on the prevalence and factors associated with work related injuries in sugar factories, the study in small and medium scale industries of north Gondar zone showed that the prevalence of occupational injury was 33.5% (20), whereas in Tendaho agriculture development enterprise 78.3% (21).

1.2.2. Body part affected, sources and type of injury and severity

Work related injuries can be occurred in different parts of the body. The date on the type of injury with the related injured parts of the body can help policy makers, managers, industrial hygienists, public health experts, to provide and design appropriate personal protective equipment and safe work place design (22, 23).

According to the study conducted in USA by the year 2013 on 262 industries, unspecified wounds 8%, superficial injuries 2%, fractures 15%, and sprains and strains account 1%. Regarding to cause of accidents in the same study fall from height 28%, struck by moving objects 17% and falling objects account 9%(24). When we see the accident agents the most frequent accident agents are transport

and lifting equipments 53% followed by working environment 22% and the least frequent accident agents are hand tools which is 5% (24).

The 2011 Paraguay's sugarcane plantation injury prevalence study revealed that the sugarcane plantation child workers suffered mostly cuts/laceration (60.8%) to their extremities mainly their hands, wrists or fingers (33.3%), legs (25.0%) and foot, ankle or toes (21.6%)(14).

Concerning on the severity of injury, 17.3% injured child workers were restricted the normal activity of work for less than 7days, 5.8% injured workers restricted for less than a month and 3.9% workers were restricted from their normal activities for more than a month(14).

A study conducted on small and medium scale industries of Gondar town showed that The severity was 17.1% of them being hospitalized with 40% of them for greater than 24 hours, 53.9% absent from work, 191 days were lost due to injuries (20).

1.2.3. Factors associated with work related injuries

The Iranian sugar producing industries indicates that the socio demographic factor age and job tenure was significantly associated with work related injuries in different part of the body (15).

According to the study conducted in Pakistan, in 2013 at Noon sugar mill Bhalwal, There is an association between salary and the health status of the workers, low wage workers did not fulfill their basic needs. The industrial social and physical environment such as relationship and behavior of co-workers and supervisors has significant association with work related injuries (25).

According to the study conducted in Pakistan sugar mill industries that was conducted in 2012, The socio demographic factors like age and educational status have significant association with work related injuries, i.e. most of the victims of the factory were lowest age groups / 16 – 25 years /.The industrial physical environment which is noise have a high significant association ($P<0.05$) with work related injuries(17).

A study conducted in India , blue collar Daurala sugar industry by the year 2011 the prevalence of musculoskeletal disorders and work related injuries were different among male and female workers, the prevalence of work related injuries and musculoskeletal disorders among male workers were 84% where as females were 76%. Concerning on the psychosocial environmental factors nearly two – third of the workers (55 -62%; P<0.05) had complaints of general chronic fatigue. Poor job satisfaction, Anxiety problem and mental work load have statistically significant association with musculoskeletal disorders and work related injuries. The study also revealed that long working hours />8hours/ and long job duration />10 years / had impact on the occurrence of musculoskeletal injuries among female workers(26) .

According to a study conducted on occupational injuries in a commune rural Vietnam transition from agriculture to new industries revealed that men experienced a 40% higher work injury incidence when engaged in agricultural works than when engaged in non agricultural work and a 90% higher work injury incidence than those engaged exclusively in agriculture. Women experienced a non significant higher in non agricultural work compared with agricultural work (9). Study conducted in Brazil revealed that the proportion of injury has no significant association with gender difference but had positive association with educational status(19). The study in Canada showed that reported injury for men was higher than women (27). From report of study done in India, being male and younger in age (<30 years) were significant factors for work related injuries (28). Study done in Oman showed that age (<30 years) has a significant association with occupational accidents (29). Some studies in Ethiopia indicated that age (1, 20) , Sex (1, 30) , work experience(20), job satisfaction (1, 20, 21), alcohol consumption (21), cigarette smoking (30),drinking of alcohol(21), sleeping disturbance (1, 20, 21), OHS training (1, 21) and utilization of PPE (30)were the major significant factors for work related injuries**.**

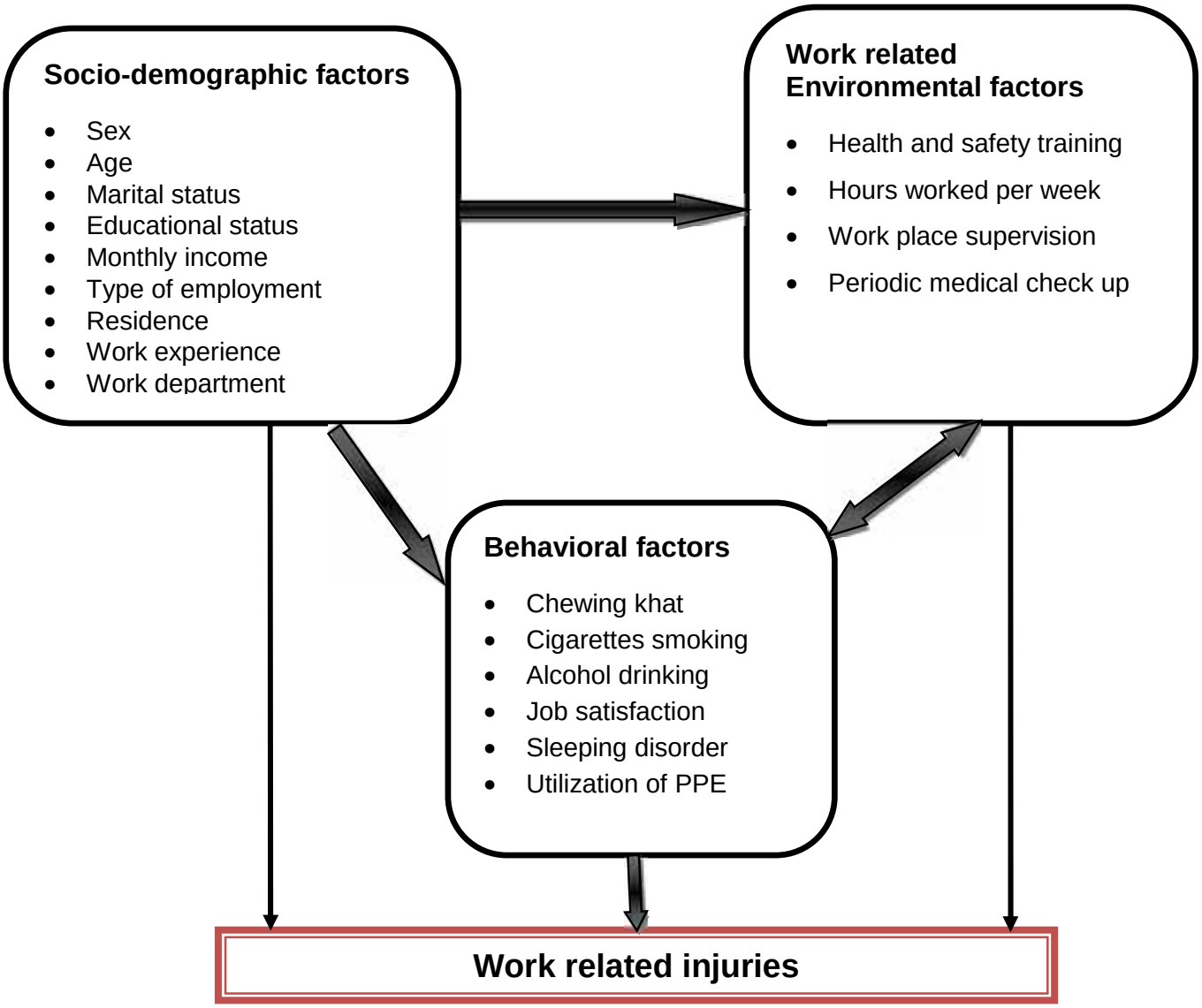


Fig – 1 – Conceptual framework of work related injuries among Tendaho sugarcane plantation workers **[Adapted from Tadesse T, Kumie A , 2007 And Yeha O., Kumie A, 2007]**

1.3. Justification of the study

In Ethiopia, occupational health and safety service has very low coverage with respect to injury recording system, research and prevention strategies. Therefore, the epidemiology of occupational injuries is scarce and reports coming from some industries do not reflect the whole picture of the country.

According to FDRE GTP; sugar industries are highly emphasized government macro economy development strategic issue and their employment related objectives are;-

- Creation of additional employment opportunities for more than 200,000 citizens (10). and Tendaho shares the higher because it's farm land is much greater.

Agriculture in Ethiopia is the foundation of the country's economy, 46.3% of GDP, 83.9% export and 80% employment is created by agricultural industries. so that, conducting a research occupational health services in sugar industries addresses huge number of nations.

As far as this author knows, there is no study conducted in sugar factory to determine the prevalence and associated factors of work related injuries in Ethiopia. Therefore the result of this study.

- May helps to contribute in filling information gaps on the existing occupational health and safety service practice of the country.
- It provide baseline information for policy makers to design strategy
- It provides baseline information for planning, implementing, monitoring and evaluation of interventional occupational health and safety programs in the sugar industry.
- Increases the achievement rate of GTP and
- Helpful for other sugar industries.

2. Objective

2.1. General objective

- To assess prevalence and factors associated with work related injuries among Tendaho sugarcane plantation workers, in Afar region, Ethiopia.

2.2. Specific objectives

- To determine the prevalence of work related injuries among Tendaho sugarcane plantation workers.
- To identify factors associated with work related injuries among Tendaho sugarcane plantation workers.

3. Method and materials

3.1. Study design and period

Institutional based cross-sectional study design was conducted from March/2014 to April / 2014.

3.2. Study area

The Afar National Regional State is one of the regional states in the Federal Democratic Republic of Ethiopia which is located in the Northeast part of the country. It is geographically located between 390 34’ and 420 28’ East Longitude and 80 49’ and 140 30’ North Latitude. The region have four national Regional States borders i.e. in the Northwest Tigray Region, in the West and Southwest; Amhara Region, in the South; Oromia Region and in Southwest; Somalia Region. The Region also shares international borders with Djibouti and Eritrea to the East and Northeast respectively. The area of region is 92,000 square Kms, Afar regional state is fifth largest region in Ethiopia. Administratively, the region is divided in to five zones, 32 districts and 401 Kebeles. Among that Aysaita and Dubti Districts are the area that this specific research has to be done.

This study was carried out in Tendaho Sugar factory owned by government and the head quarter located at Dubti town where as the farm and the factory found in Aysaita and Detbahri towns respectively , The head quarter Dubti is 580 Kms. away and North-east of Addis Ababa. This plant was established in Nov. 1960 by Mitchell Cotts P.L.C UK as Tendaho Agricultural Development S.C Then the company owned by the government and by the year 2006 the council of ministers re established the share company as Tendaho sugar factory by regulation No_122/2006 (31). Know the main product of the company is growing Sugarcane.

Tendaho Sugar factory had a total of 12450 employees, of which 1880 workers were employed in the administrative and factory operation of the company where as the rest 10570 workers found in the sugarcane plantation. The company had one satellite clinic in Dubti town, one clinic at Detbahri state farm and one Hospital at Aysaita .The

Company also use Dubti Hospital owned by Afar Region Health Bureau located in Dubti town. Injury recording was managed by both two clinics and Aysaita hospital and administrative office within 24 hours after the incident occurred.

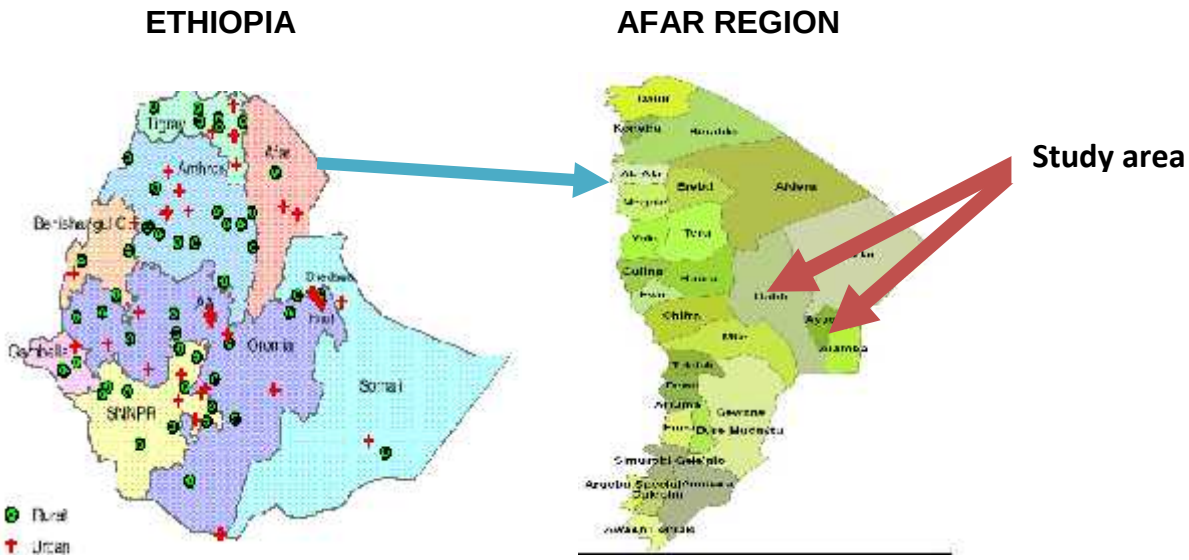


Figure 2- Diagrammatic representation of the Aysaita and Dubti District, Afar region, Ethiopia, 2014. (Source – ANRS Atlas)

3.3. Source and study population

- All Tendaho sugarcane plantation workers.

3.4. Study subject

All selected Tendaho sugarcane plantation workers

3.5. Inclusion and exclusion criteria

3.5.1. Inclusion criteria- All Tendaho sugarcane plantation workers who were directly engaged in production process.

3.5.2. Exclusion criteria – All administrative staff were excluded

3.6. Sample size and sampling procedure

3.6.1. Sample size

The sample size was determined by using single population proportion formula by the following assumptions. Sample size (n)

- $Z_{\alpha/2}$ (95% confidence interval
- P=50%- There is no previous study conducted on sugarcane plantation
- A marginal error of 4% (d) and 10% of non response rate

$$n = \frac{Z^2_{\alpha/2} P(1-P)}{d^2} = \frac{(1.96)^2\, 0.5(1-0.5)}{(0.04)^2} = 600$$

10% non-response rate = 60

Based on this the total required sample size was 660 workers

3.6.2. Sampling procedure

The sampling procedure was carried out by forming three sample strata of the respective geographically far apart working area which is Aysaita branch Office, Detbahri branch office, and Dubti branch office and Head quarter of Tendaho sugar factory. Then each strata further classified into different sub- strata based on their nature of work as agriculture, workshop, power supply and garage, which is illustrated in figure -2, then finally the study unit were obtained from each sub strata by simple random sampling.

The sample size of each strata and sub- strata were calculated by using proportional allocation of sample size formula which is $\mathbf{n_i = nN_i/N.}$ (where; n= total sample size calculated from the population/strata, n_i = sample size from each strata/sub-strata, N_i = Total population of strata/sub strata , N = Total population/Total population of the strata/).

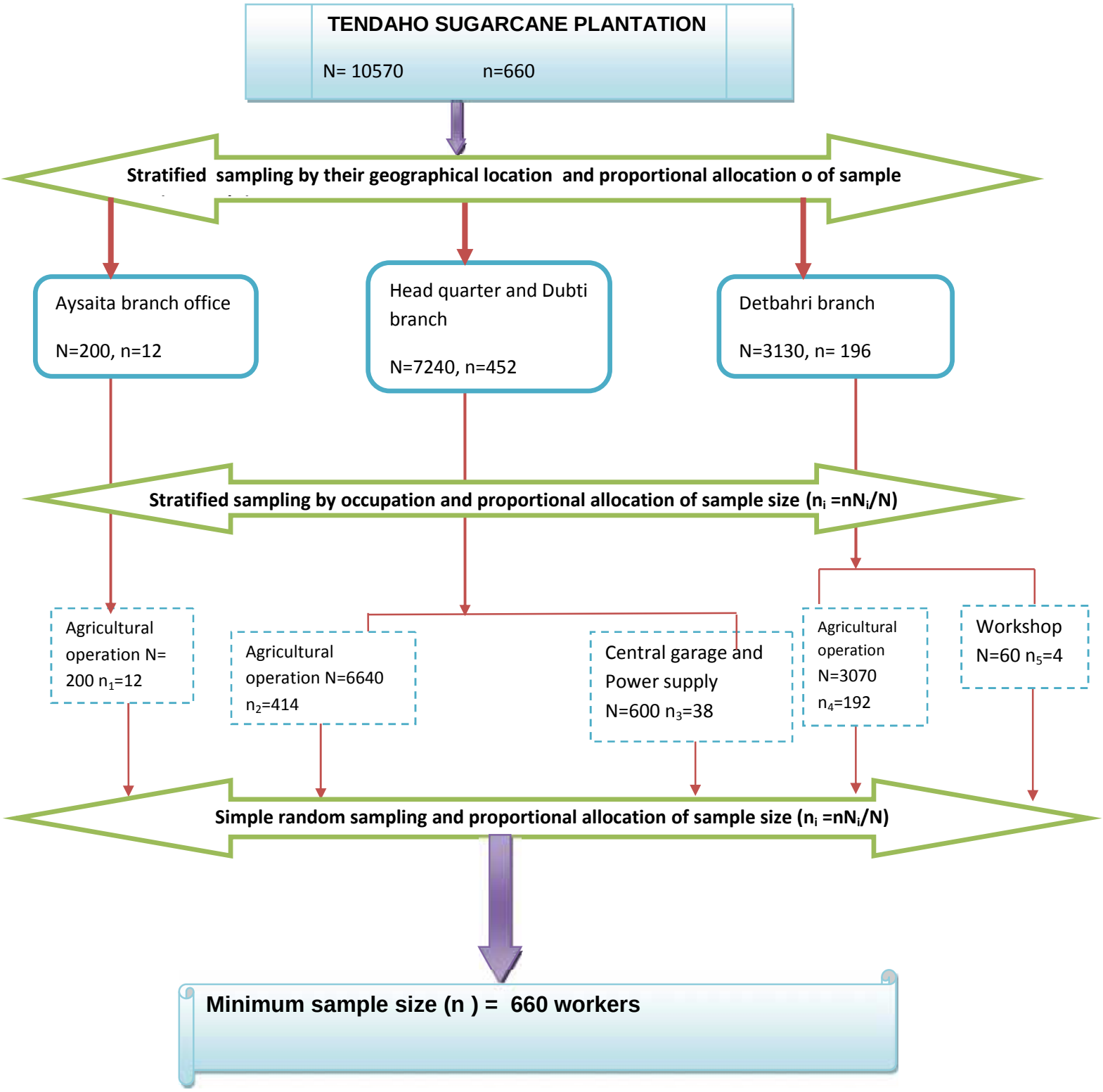


Figure 3- Schematic representation of sampling procedure

3.7. Variables of the study

3.7.1. Dependent variable

- Work related injuries

3.7.2. Independent variables

Socio demographic factors: Age**,** Sex**,** Religion, Marital status**,** Educational level**,** Monthly Income**,** Work experience**,** Type of employment.

Working Environment factors: health and safety training, hours worked per week, periodic medical checkup, health and safety supervision.

Behavioral factors: Alcohol drinking, Cigarette smoking**,** Khat chewing**,** Personal protective equipment use, Job satisfaction, sleeping disorder**.**

3.8. Operational definitions

Work related injury: any physical damage of human body or tissue at least once results from harmful contact between people, objects and substances during or in connection with the performance of his or her work (1).

Severity of injury – characterized by hospitalization more than 24hours and absent from work over 3 days in the last one year (1).

Sleeping disturbance problem: The presence of sleepiness problem when the worker is at work in the factory (1).

Work place supervision: Regular supervisions done by health and safety responsible bodies in the department and working rooms (1).

Utilization of Personal Protective Equipment (PPE): Utilization of specialized clothing or equipment by employees for protection against health and safety hazards at the time of interview. Personal protective equipment is designed to protect many parts of the body, i.e., eyes, head, face, hands, feet, and ears (1).

Health and safety training: Training given to sugarcane plantation workers about occupational health and safety.

3.9. Data collection procedure

A structured pretested questionnaire and observational checklist was used for data collection. The data was collected by using face to face interview. Six data collectors and two supervisors who were bachelor graduate in Mathematics and Public management were recruited for data collection.

Training was given to the data collectors and supervisors for two days on the objectives and relevance of the study, confidentiality of information, respondents' right, about pretest, informed consent and techniques of interview. Before conducting data collection, pre test was undergone in the town among persons that does not work in the factory with 5% of the minimum sample size to ensure the validity of the study tool and to standardize the questionnaire.

The supervisors and the principal investigator were make frequent checks on the data collection process and 5% cross check was done, to ensure the completeness and consistency of the gathered information and errors found during the process was corrected at the spot.

3.9.1. Data quality control

The questionnaire was prepared originally in English and translated to Amharic and back to English to keep the consistency of the questions. Training of data collectors & supervisors and pre testing of questionnaire was made to ensure the quality of data. Principal investigator and supervisors made spot-checking and reviewing the completed questionnaires on daily bases to ensure completeness and consistency of the information collected. Double data entry was made to keep consistency and maintaining data quality.

3.10. Data processing and analysis

The data was entered in to SPSS version 16 statistical package for analysis. Bivariate logistic regression analysis was employed to see the association between each independent variables and work related injuries. Data cleaning was performed to check for frequencies, accuracy, consistencies and missing values of variables. After then any errors were re-corrected. Frequencies, proportions and cross tabs was used to describe the study population in relation to relevant variables.

Crude odds ratio with confidence intervals were used to see the association between determinant factors and work related injuries. Variables with $P < 0.2$ during the Bivariate analysis were included in the multivariate analysis to see the interaction effect of confounding variables. Adjusted odds ratio with 95% confidence interval at $P < 0.05$ was calculated.

4. Ethical consideration

Ethical clearance was obtained from the ethical review board of Institute of public health, University of Gondar and a formal letter was also obtained to Tendaho Sugar factory. The purpose and importance of the study was explained to the participants. Data was collected after full informed verbal consent was obtained and confidentiality of the information was maintained throughout by excluding names as identification in the questionnaire and keeping their privacy during the interview by interviewing them alone. During data collection, facilitation of treatment and first aid was maintained for those workers who were injured during data collection.

5. Results

5.1. Socio-demographic characteristics

A total of Six hundred sixty workers were included in this study giving the response rate (99.09%). Majority of study participants, Three hundred eighty (58.1%) were male and 274(41.9%) were female. The mean (± SD) age of respondents was 29.7 (± 2.66) years. Nearly half Three hundred thirteen (47.9%) respondents were Orthodox Christian followed by 307(46.9%) of Muslims, and 34(5.2%) were others. Most respondents, 339(51.8%), were Amhara by ethnicity followed by 188(28.7%) Oromo and 127(19.5%) were others. According to marital status Three hundred twenty (48.9%) respondents were married and 219(33.5%) were single. Regarding to educational level, 115(17.6%) respondents were attended elementary school and below, 311(47.5 %) were secondary education, 228(34.9%) respondents were graduate from TVET and University by diploma and bachelor degree. Most study participants Five hundred seventeen (79.1 %) were employed as a permanent employment type whereas the rest 137(20.9 %) respondents were employed temporarily. Three hundred forty nine (53.3 %) respondents had 1 to 3 years of service duration and 152(23.3 %) were 4 to 6 years of service duration and 153 (23.4%) respondents were greater than or equal to seven years of working experience. Most, One hundred eighty one (27.7 %), respondents had monthly payment of Birr 1480.00 to 2179.00 ETB based on collective agreement of the factory by considering free accommodation, health service and insurance. Regarding to working departments 49(7.5%) workers were selected from the garage, workshop and maintenance service where as 605 (92.5%) workers was selected from the agricultural and machine operations. (Socio-demographic characteristics of the respondents were presented in table-1).

Table – 1 – Socio-demographic characteristics of the Tendaho sugarcane plantation workers, in Afar region, Ethiopia, April - 2014. (n=654)

Characteristics	Frequency	Percentage
Sex		
Female	274	41.9%
Male	380	58.1%
Age (years)		
18 – 26	286	43.6
27 – 35	238	36.5
36 - 44	81	12.4
≥ 45	49	7.5
Marital status		
Married	320	48.9
Unmarried	219	33.5
*[1]Others	115	17.6
Residence		
Urban	255	39
Rural	399	61
Ethnicity		
Amhara	339	51.8
Oromo	188	28.7
*Others	127	19.5
Educational status		
Elementary school and below (grade 1 to 8)	115	17.6
High school (grade 9 to 12)	311	47.5
TVET Diploma and B.A/BSc. Degree	228	34.9
Work department		
Agricultural and machine operation	605	92.5
Garage, workshop and maintenance service	49	7.5
Employment pattern		
Permanent	517	79.1
Temporary	137	20.9

NB = **Others=Tigrai, Wolaita, Hadiya and Afar**

5.2. Work environment characteristics

As it is shown in table – 2, Four hundred seventy one (72%) of the study participants were work less than or equal to 48 hours per week whereas the rest 183 (28%) workers were engaged in overtime work that exceeds the weekly working time limit which is 48 hour. Regarding to the provision of Occupational Health and Safety training to the workers Six hundred (91.7%) workers never take OHS training during their working period, whereas 54(8.3%) workers were got OHS training. Among the total 54 (100%) OHS trained workers, 32 (59.3%) workers were trained within the past 6 months, 19 (35.2%) workers were trained in the past 7 – 18 months of period, 2 (3.7%) workers were trained in 19 – 30 months and 1 (1.9%) worker was trained before 30 months of the study period.

Table – 2 also describes that , Fifty two (8%) of the respondents work stations were supervised by the competent person/authority whereas the rest 602(92%) respondents work stations were not supervised their OHS issues by the competent authority or person. Periodic medical checkup is one of the occupational health hazard confirmatory procedures that should be done by the authority of the employers. Six hundred twenty three (95.3%) respondents replied that they were never taken a periodic medical checkup since they employed whereas 31(4.7%) respondents had taken a periodic medical checkup. Among workers who were take periodic medical checkup which is 31(100%), 13(41.9%) were taken every three months, 7(22.6%) were taken every six months, whereas the rest 11(35.5%) were taken their periodic medical checkup with one year time lapse.

Table–2-The environmental characteristics of Tendaho sugarcane plantation workers in Afar region, Ethiopia, April - 2014. (n=654)

Characteristics	Frequency	Percentage
Hours worked per week		
≤ 48 hours per week	471	72
Greater than 48 hours per week	183	28
Presence of workplace OHS supervision		
Yes	52	8
No	602	92
Presence of OHS training		
Yes	54	8.3
No	600	91.7
Since how long your last training session		
≤ 6m0nths	32	59.3
7 months – 18 months	19	35.2
19 months – 30 months	2	3.7
Above 30 months	1	1.9
Presence of medical checkup		
Yes	31	4.7
NO	623	95.3
How frequent the medical checkup		
Every three months	13	41.9
Every six months	7	22.6
Every year	11	35.5

5.3. Workers behavioral characteristics

Regarding to sleep disorders One hundred forty two (21.7%) of the respondents had a problem of sleep disorders whereas the rest 512(78.3%) didn't have a problem of sleep disorders. Among the respondents who had sleep disorders 91(64.1%) workers exposed to sleep disorders due to working more than 8 hours without shift, 47(33.1%) workers were exposed due to working at the evening and 4(2.8%) were due to working more than one work at a time.

Concerning on the status of job satisfaction Five hundred seventy seven (88.2%) respondents were satisfied with their jobs whereas the rest 77(11.8%) respondents were not satisfied with their jobs.

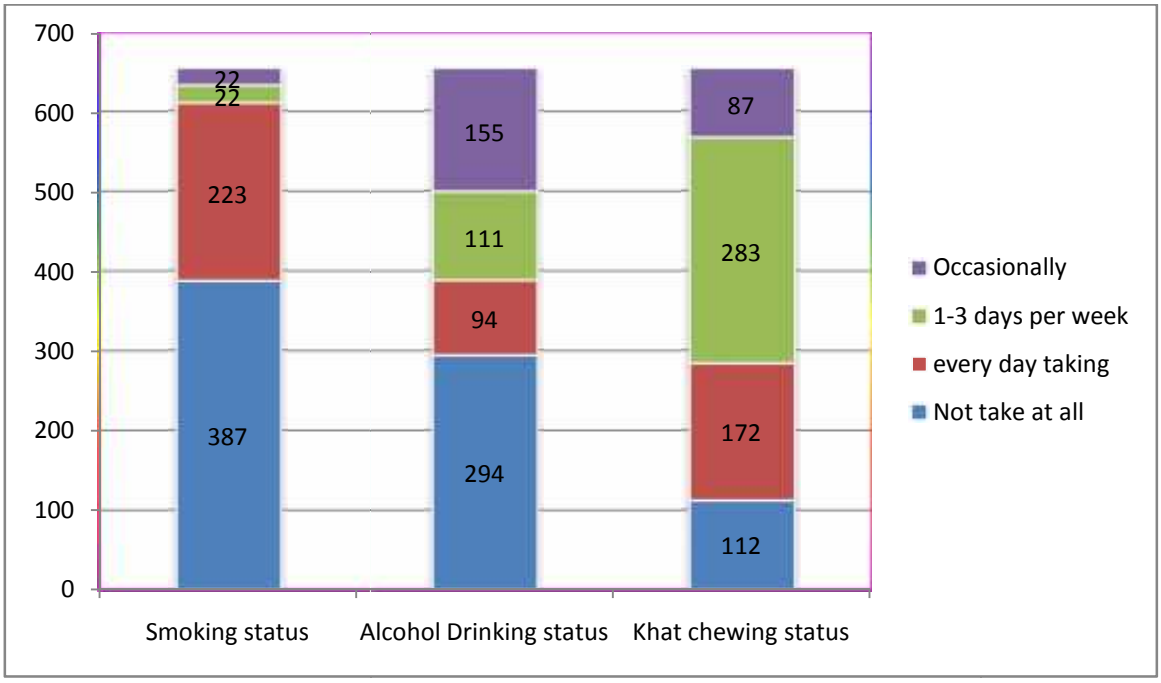
Three hundred sixty four (55.7%) workers did not utilize PPE because the company didn't provide them, 6(0.9%) due to lack of OHS training they didn't utilize PPE, 13(2%) due to the poor quality of the PPE they never utilize PPE, 12(1.8%) due to discomfort they didn't utilize PPE, 6(0.9%) due to decreasing the performance they didn't utilize it and other 167(25.5%) respondents didn't utilize due to so many other problems whereas the rest 86(13.1%) respondents were utilize PPE that were provided from their employer. (Table – 3)

Table – 3- The behavioral characteristics of Tendaho sugarcane plantation workers in Afar region, Ethiopia, April - 2014. (n=654)

Characteristics	Frequency	Percentage
Sleeping disorders		
Yes	142	21.7
No	512	78.3
Cause of sleep disorders		
Due to working more than 8 hours without shifting	91	13.9
Working in the evening	47	7.2
Working more than one work at a time	4	0.6
Job satisfaction		
Yes	577	88.2
No	77	11.8
Utilization of PPE		
Yes	86	13.1
No	568	86.9
Reasons for not utilizing PPE		
Lack of PPE	364	55.7
Lack of OHS training	6	0.9
Discomfort during utilization	12	1.8
It decrease work performance	6	0.9
Due to provision poor quality PPE	13	2
Others*	167	25.5

NB. = others* = (1 &2 and 1, 2, and 3) = [(Lack of PPE , Lack of OHS training) and (Lack of PPE Lack of OHS training Discomfort during utilization)]

About Two hundred twenty three (34.1%), 22(3.4%) and 22(3.4%) of the respondents smokes cigarettes every day, 1 – 3 days per week and occasionally respectively, where as the rest 387(59.2%) do not smokes at all. Regarding to alcohol drinking 94(14.4%), 111(17%) and 155(23.7%) of respondents drinks alcohol every day, 1 -3 days per week and occasionally respectively, while 294(44.9%) didn't drink alcohol at all. Majority of the respondents which is Five hundred forty two (82.9%) Chew khat where as 112(17.1%) respondents didn't chew Khat at all. (Figure – 4)



Figure–4–A bar graph that shows the status and frequency of cigarette smoking, alcohol drinking and Khat chewing in the past 12 months among Tendaho sugarcane plantation workers in Afar region, Ethiopia, April - 2014. (n=654)

5.4. Work related injuries characteristics

5.4.1. Injury prevalence

Regarding to injury status among the study participants Five hundred seven (77.5 %) with 95% CI (74.6 – 80.7) workers were injured at least once their body parts due to their work in the last one year , the two weeks prevalence of work related injuries half of the study participants 327(50%) were injured.(Table – 2)

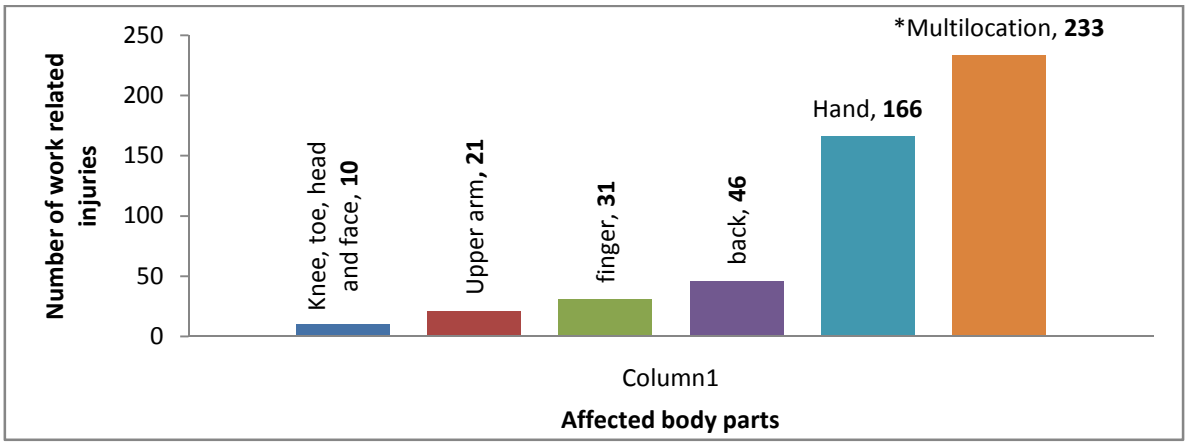
Concerning on the number of injury present in each injured workers, table 2 shows that Three hundred thirty five (51.2%) workers were injured 1 -3 times per year, 171(26.1%) workers were injured 4 -6 times in a year and 1 (0.2%) workers was injured above 10 times per year. Regarding to the two week injury prevalence all Three hundred twenty seven (100%) injured workers were injured 1 – 3 times injury within two weeks

Table – 4- Distribution of work related injuries the past 12 months and 2 weeks among Tendaho Sugarcane plantation workers in Afar region, Ethiopia, April- 2014. (n=654)

Characteristics	Frequency	Percentage
Work related injuries in the last 12 months		
Yes	507	77.5
No	147	22.5
Number of injuries happened in the last 12 months		
1 – 3 injuries per year	335	51.2
4 – 6 injuries per year	171	26.1
≥ 10 injuries per year	1	0.2
Work related injuries in the past 2 weeks		
Yes	327	50
No	327	50
Number of injuries happened in the past 2 weeks		
1 – 3 injuries per 2 weeks	327	100

5.4.2. Affected body parts due to work related injuries

As illustrated in figure – 5, the most affected body part due to work related injuries were different body part at the time of injury which accounts 233(35.6%) followed by hand which is 166(25.4%) ,46(7%) back, 31(4.7%) finger and 21(3.2%) upper arm.

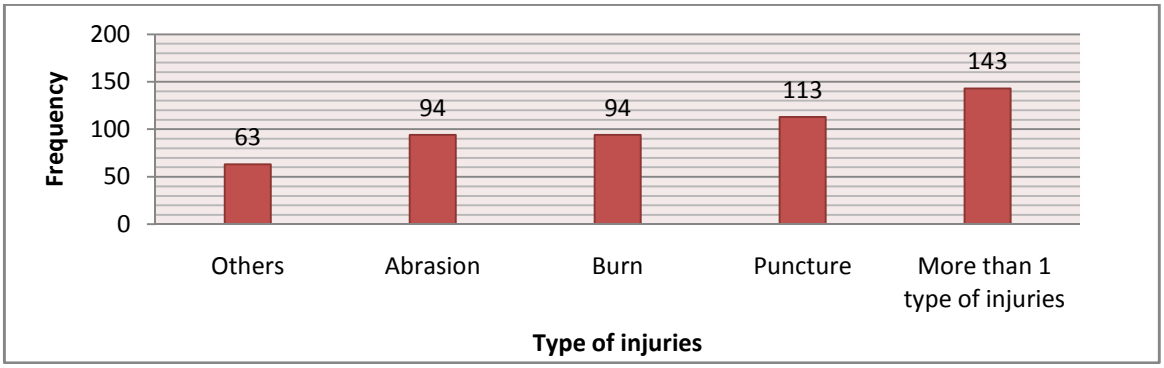


N.B. * Multi location = Occurrence of injuries in different body part at one time exposure.

Figure – 5 – Distribution of work related injuries in the past 12 months by affected body part among Tendaho sugarcane plantation workers in Afar region, Ethiopia, April - 2014. (n=507)

5.4.3. Type of injuries

The most prevalent type of injuries were puncture 113(17.3%), abrasion 94(14.4%), burn also 94(14.4%), and other type of injuries were happened additionally with other types. (Figure – 6)



***Others = Fracture, dislocation, suffocation, amputation, cut and neural disorders**

Figure – 6 – Distribution of work related injuries by type of injuries among Tendaho sugarcane plantation workers in Afar region, Ethiopia, April - 2014. (n=507)

5.4.4. Causes and sources of work related injuries

As described in table -5, among the Five hundred seven (100%) total injured workers 391 (77.1%) workers were injured during working of their own works, 75 (14.8%) workers were injured during helping of their colleagues the rest 41 (8.1%) workers were injured because of the introduction of new working conditions and materials. Regarding to the sources of injury hand tools create most of the injuries which is 139 (27.4%), fire 90 (17.8%), machineries 84 (16.6%), lifting heavy objects 52 (10.3%), collision with objects 25 (4.9%), electricity 5 (1%) and the other injury were created due to more than 2 sources of injuries.

Table – 5 – Distribution of source of injuries and works done during injury in past 12 months among Tendaho sugarcane plantation workers in afar region, Ethiopia, April - 2014. (n=507)

Characteristics	Frequency	Percentage
Works during injury		
Working their own work	391	77.1
Helping workplace colleague	75	14.8
Introduction of new work condition	41	8.1
Sources of injury		
Hand tools	139	27.4
Fire	90	17.7
Machinery	84	16.6
More than 1 sources	65	14.6
Lifting heavy objects	52	10.3
* Others	68	13.4

***Others = Hit by falling objects, Electricity, Splintering objects, Falls, Collision with objects and emission of dusts**

5.4.5. Hospitalization and severity of injuries

Out of total Five hundred seven (100%) injured respondents 425(83.8%) were hospitalized in health institution, Among the hospitalized Four hundred twenty five (100%) workers, Three hundred twelve (73.4%) of them were hospitalized for less than 24 hours and 113(26.6%) were hospitalized above 24 hours .Regarding to the days lost due to injuries of the hospitalized workers, Three hundred seventy nine (89.2%) injured workers lost 1-3 days, 41(9.6%) workers lost 4–6 working days, 1(0.2%) workers lost 7-9 days and 4(0.9%) workers lost above 16 working days. Concerning on severity of work related injuries, Out of 507(100%) injured respondents, 46(9%) respondents were hospitalized for more than 24 hours and more than 3 working days was lost, which was severe. (Figure-7)

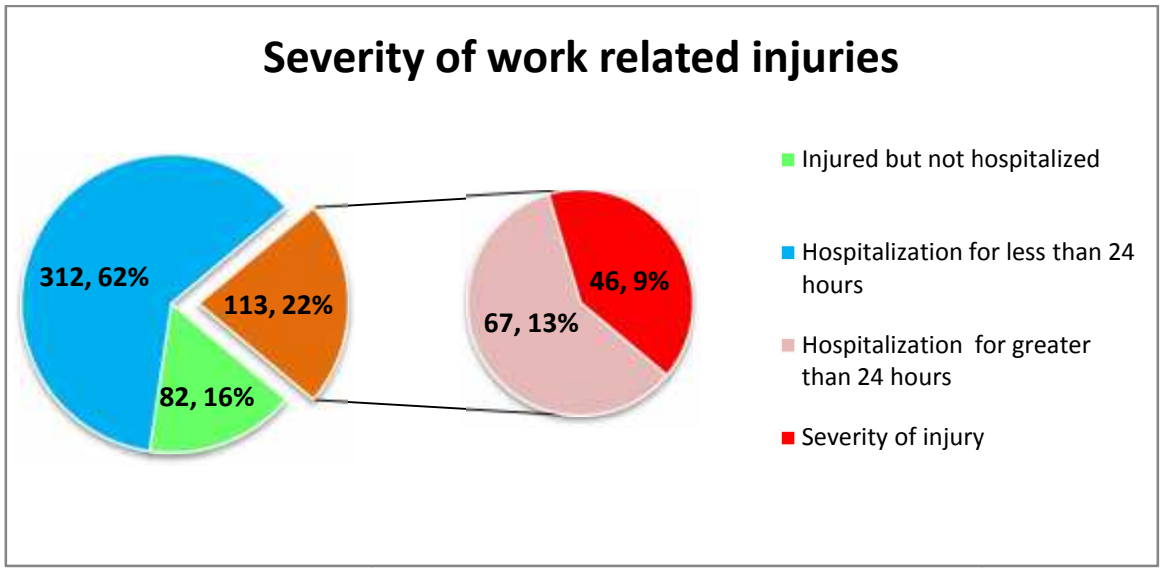


Figure – 7 – Graphical illustration of Hospitalization and severity of work related injuries among Tendaho Sugarcane plantation workers, in Afar region, Ethiopia, April - 2014. (n=507)

5.4.6. Days and times of injury

Pertaining to day and time of injuries, out of Five hundred seven (100%) injuries, 307(60.6%) of the workers injured on Monday, 150(29.6%) Wednesday, 20(3.9%) Tuesday, followed by 15(3%) and few numbers of injuries occurred on Friday, Saturday and Sunday 5(1%), 6(1.2%) and 4(0.8%) respectively / Figure -8 /

Regarding to the time of the day when the injury occurred, higher percentage of injury was reported at the morning and afternoon which was 273(53.8%) and 228(45%) respectively, while few accidents occurred at evening 5(1%) and 1 (0.2%) injury occurred at the mid night of the day. / Figure – 8/

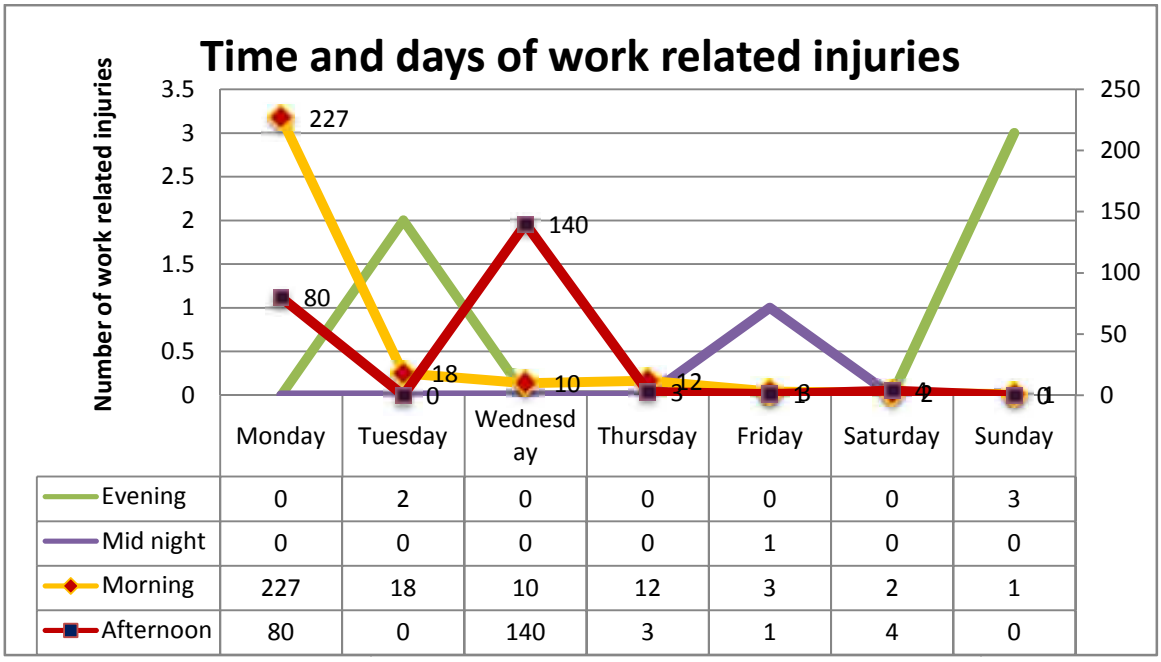


Figure – 8 – Line graph representation of work related injuries by time and days of injury in the past 12 months among Tendaho sugarcane plantation workers in Afar region, Ethiopia, April - 2014. (n=507)

5.5. Work environment observation

The work environment observation revealed that both the agricultural and garage section of the work place was exposed with different occupational hazards like exposure to excessive heat, dust, awkward posture, biological hazards like animal and insect bite, exposure to chemicals like sulfuric acid, vibration and other hazards.

Despite there is curative health services in the factory, there was no safety division and personnel that help in promoting health and safety conditions at work places. Warning signs and health and safety instructions or procedures did not exist in all working sections. Similarly, all working sections had not first aid equipment except they had satellite clinic at central level.

Occupational safety and health committees were not yet established in the factory. Regular visits and inspection on health and safety conditions of work places were not made at all levels. In addition, programs on prevention, advocacy, awareness creation and capacity building were not undertaken. Based on the observation made most workers did not use personal protective devices at work places except some of the garage and maintenance workers, most daily laborers use their own hand tools in the field which were not of the standard. No meeting was held in the last six months with employees to discuss health and safety issues. Moreover, training needs in connection with new employment, equipment, or other changes were not considered accordingly.

There was no drinking water and sanitary facilities like showers, toilet and hand washing tap water at each workplace with the consideration of sex and their number that was stated in FDRE national OHS directive.

In general, although the company has a collective agreement; the value of occupational health and safety services is being undermined. (Fable – 6)

Table-6 - Occupational hazards identified in some working sections, in Tendaho sugarcane plantation workers in Afar region, Ethiopia, April - 2014. (n=654)

Working department	Hazard identified
Agricultural operation manual workers and machine operators(Loader ,Dozer, etc…operators)	Exposure to biological hazards like insect and animal bite and venom, crashed by animal and sugarcane trees, burn, since it's an open air work there is exposure to sunlight heat radiation and dusts, awkward posture, working with un fit hand tools and whole body vibration.
Vehicle workshop	Awkward posture, contact with organic solvents like naphthalene, grease and oil, working with hand tools and electrical machines, slippery wall
Electricity workshop	Contact with sulfuric acid, electrical hazards, working with hand tools and electrical machines, slippery wall
Tire repair and maintenance	Working in open air environment leads to higher exposure to excessive sun light heat and dusts, electrical hazard, working with heavy hand tools, awkward posture
Welding shop	Electrical hazard, un organized work environment, co and co_2 smokes during welding, exposure to sun light and welding machine radiation, exposure to dusts.

Identified problems that was common for all workplaces

- There is no PPE except for some work station that was only full clothing and shoes
- There is no any periodic medical checkup except pre employment medical checkup
- Lack of provision of training on OHS and safe working procedure
- Lack of toilet, shower and other sanitary facilities at work place with the consideration of sex and number of employees as it was stated in FDRE national OHS directive.
- There is no hazard sign and safety phrases in the work place
- There is no safety officer and work place joint safety committee

5.6. Factors associated with work related injuries

The Bivariate and multivariate logistic regression model was used to determine the significant determinant factors of work related injuries by using statistical software SPSS version 16 through coding the interested outcome variable “Yes” as 1 and “No” 0.

As it is showed in table 7, among the socio-demographic variables age, educational status and marital status of the workers had statistically significant association with work related injuries during the multivariate analysis. Workers whose age between 18 – 29 years were 2.6 times more likely to report work related injuries than workers age between 30 – 50 years [AOR:2.603,95%CI:(1.432 – 4.731)]. Similarly workers whose educational status were elementary and below were 3.9 times more likely to experience work related injuries than workers whose educational status were high school and above [AOR:3.948,95%CI:(1.814 – 8.593)]. Regarding to marital status workers who were never married in his/her life were 3.3 times more likely to experience work related injuries than workers who were ever married in his/her life [AOR: 3.314, 95%CI, (1.700 – 6.464)].

Regarding to the selected environmental variables, work place OHS supervision and OHS training showed a statistically significant association with work related injuries in Bivariate analysis but their significance disappeared in the final steps of multivariate analysis. (Table-7)

Among behavioral factors entered in the final step of multivariate analysis, Cigarette smoking status, Khat chewing status and sleep disorders were showed statistically significant association with work related injuries.

Workers who were drink alcohol 2.6 times more likely to report work related injuries than workers who were not drink alcohol [AOR: 2.610, 95%CI: (1.574 – 4.327)]. Concerning on khat chewing status of the workers, workers who were chew khat 8.4 times more likely to report work related injuries than the non khat chewers [AOR: 8.467, 95%CI: (4.696 – 15.267)]. Similarly workers who had a problem of sleep disorders were 8.6 times more likely to report work related injuries than their counterpart [AOR: 8.675, 95%CI : (3.776 – 19.932)].

Table-7- Selected associated factors of work related injuries in Tendaho Sugarcane plantation workers in , Afar Region, Ethiopia, April 2014. (n=654)

Characteristics	Work related injuries		COR(95%Cl)	AOR (95%Cl)
	Yes	No		
Age(year)				
18 – 29	282(81.5%)	64(18.5%)	1.625 (1.123 – 2.353)**	2.603(1.432 – 4.731)**
30 – 50	225(73%)	83(27%)	1.00	1.00
Educational status				
≤Elementary school	103(89.5%)	12(10.5%)	2.868 (1.529 – 5.379)**	3.948(1.814-8.593)**
≥ High school	404(75%)	135(25%)	1.00	1.00
Marital Status				
Never married	186(85%)	33(15%)	2.002(1.305 – 3.069)**	3.314(1.700 – 6.464)**
Ever married	321(74%)	114(26%)	1.00	1.00
Residence				
Rural	329(82.5%)	70(17.5%)	2.033(1.402 -2.948)**	
Urban	178(69.8%)	77(30.2%)	1.00	
Regular OHS supervision				
No	483(80.2%)	119(19.8%)	4.735(2.649-8.469)**	
Yes	24(46%)	28(54%)	1.00	
Sleep disorders				
Yes	132(92.9%)	10(7.1%)	4.822(2.463 – 9.443)**	8.675(3.776 – 19.932)**
No	375(73.2%)	137(26.8%)	1.00	1.00
Chewing khat				
Yes	463(85.4%)	79(14.6%)	9.058(5.787 – 14.177)**	8.467(4.696 – 15.267)**
No	44(39.2%)	68(60.8%)	1.00	1.00
Drinking alcohol				
Yes	310(86.1%)	50(13.9%)	3.053(2.077 – 4.4487)**	2.610(1.574 – 4.327)**
No	197(67%)	97(33%)	1.00	1.00

N.B. - Ever married= Married, Divorced and Widowed, *Never married = Unmarried

1.00= Reference category, *= P-value < 0.05, **= P-value ≤0.01

6. Discussion

Work related injuries are a global public health and economic burden in addition to other public health challenges in both developed and developing countries. However, determining the magnitude of work related injuries and identifying associated factors are important in the development of injury prevention strategy at work place (7).

This study showed that work related injuries were common among workers in sugarcane plantations. Most of the study population 775 per 1000workers per year had experienced some form of work related injuries during the 12 months prior to the study period with 95% CI (74.6 – 80.7). The two week period incidence on the other hand was 500 work related injuries per 1000 exposed workers. This figure is markedly greater than rates reported by other studies. Studies conducted in Paraguay sugarcane plantation and Pakistan sugar industries showed that the prevalence of work related injuries were 257 and 437 per 1000 exposed workers per year respectively (14, 17). This study showed higher rate of work related injuries compared to study done in Pakistan and Paraguay. This could be due to poor promotion and preventive occupational health and safety measures at work place such as less coverage of work place occupational health and safety supervision 52(8%), health and safety training 54(8.3%), utilization of PPE 86(13.1%), periodic medical checkup 31(4.7%) and adaptation of khat chewing at the afternoon 542(82.9%) may contributes to increase the prevalence of work related injuries in the study. But the prevalence of work related injuries in this study finding was lower than a study conducted in Iran sugar industry and Tendaho agricultural development share company which is 87.1% and 78.3% respectively (15, 21).

Regarding to the severity of work related injuries in the study area 650 workers per 1000 exposed workers per year were hospitalized , among that 477 workers per 1000 exposed workers per year were hospitalized below 24 hours whereas 173 workers per 1000 exposed workers per year were hospitalized above 24 hours. Study in Paraguay sugarcane plantation and North Gondar zone small and medium scale industries showed that the severity of work related injuries as 270 workers per

1000 exposed workers per year and 171 workers per 1000 exposed workers per year were hospitalized respectively (14, 20). This study showed that higher rate of hospitalization was reported as compared with Paraguay and North Gondar zone. The work place environment observation revealed that most of the workers were exposed with different hazards at a time like excessive heat, excessive noise, dust and biological hazards with the absence of PPE, OHS training and work place OHS supervision.

This study showed that puncture, abrasion, burn, dislocation and multiple type of injury had the most dominant type of injury type in the study area. Studies conducted in North Gondar zone and Tendaho agricultural development enterprise revealed that except burn all other types of injuries were the most commonly occurred type of injuries (20, 21). This could be mainly because most of the sugarcane workers were engaged in sugarcane burning work procedure that leads workers becomes burn with fire.

In this study most of the workers 233(35.6%) injured in different parts of the body at one time exposure (i.e. fingers, hands, arms, back) followed by hands 166(25.4%), back 46(7%) and fingers 31(4.7%). A study in Paraguay revealed that hands, wrist and finger 33.3%, legs 25% and foot, ankle or toes 21.6%(12), The North Gondar zone and Tendaho agricultural development enterprise findings were consistent with this study(20, 21).

A study conducted in USA on the sources of work related injuries fall from height 28%, struck by moving objects 17% and falling objects 5%. The Hubei Chinese agricultural farm study showed that hand tools 147(31.5%), falls 122(26.1%) and heavy falling objects 48(10.3%) (11). this study also revealed that hand tools 139(21.3%), fire 90(13.8%), machineries 84 (12.8%) and lifting heavy objects 52(8%) are the most common cause of work related injuries. The result was in agreement with the Hubei and USA findings (11, 24).

Researchers mentioned several factors that related to the occurrence, severity, type and sources of work related injury, such as socio-demographic factors, working

environment factors and worker's behavioral factors as the commonest possible risk factors for workers to be injured in work place (1, 20, 21, 30).

In this study age of the workers were significantly associated with work related injuries, the youngest workers whose age between 18 -29 years were 2.6 times more likely injured as compared with the age between 30 -50 years [AOR: 2.603, 95%Cl:(1.432 – 4.731)].This study finding was agreed with study conducted in Pakistan (17), India (28)Oman (29), and Ethiopia (1, 20, 21).

In this study educational status had significant association with work-related injuries. Workers whose educational status were elementary school and below were nearly 4 times more likely to be injured than workers who were learn high school and above [AOR:3.948 ,95%CI, (1.814 - 8.593)]. A study conducted in Pakistan and Brazil revealed that educational status of the workers have significant association with work related injuries and productivity of the industry , worker who were not got education were higher for work related injuries and produce lesser productivity (17, 19). The finding also consistent with a study conducted in Ethiopia (20, 21, 30).

Regarding to marital status of the workers, Workers who never married were 3.3 times more likely to be experienced work related injuries than workers who were ever married in his/her life [AOR:3.314 ,95%CI, (1.700 - 6.464)]. Marital status may influence lifestyle, the age of a single workers were younger they never experience the responsibility to take care of dependents, for instance they may drink more than ever married ones , Ever married have exercise responsibilities for their families and may not do unsafe actions than unmarried ones. Ever married could have less stress than others because they may expose to a problem once in their history.

Regarding to the behavioral factors, sleeping disorders were significantly associated with work related injuries. Workers who had sleeping disorders were 8.6 times more likely experienced work related injuries than their counterpart [AOR:8.675,95%CI:(3.776 -19.932)].This is consistent with study done in Ethiopia (1, 20, 21).

Drinking alcohol and khat chewing status also significantly associate with work related injuries. Workers who drank alcohols were 2.6 times more likely to be

experienced work related injuries as compared with their counterparts [AOR:2.610,95%CI:(1.574 - 4.327)] . Drinking of alcohol is significantly associated with work related injuries in a study done in Afar Tendaho (21). Alcohol drinking can increase the risk of injury through engaging in risk taking behavior or reducing the perception and response of to hazards. They may unable to keep balance and may not conscious.

Workers who chew khat were 8 times more likely to be experienced work related injuries as compared with their counterparts [AOR:8.467 ,95%CI:(4.696 - 15.267)] . As it is described in the descriptive part of this study 542(82.9%) respondents were chew khat, and workers after chewing khat they become excited and unable to control their muscles and fast pace of work may expose to work related injuries.

7. Limitation of the study

- One year cross-sectional study design could result in recall bias (under or over report of injury events).
- Workers who were injured and on leave during the study time may affect any association.
- Lack of similar studies particularly in Ethiopia made difficult in comparing results.
- Cross-sectional study design may not show temporal relationship.

8. Conclusion and recommendation

8.1. Conclusion

In this study, the overall work related injury prevalence rate was very high.

Among the socio-demographic factors, age, educational status and marital status and the behavioral factors, alcohol drinking status, khat chewing status and sleeping disorders were a statistically significant factors for the occurrence of work related injuries.

8.2. Recommendations

The following recommendations are forwarded from the findings of the study:-

To Tendaho Sugarcane plantation management body

- Provide standard quality personal protective equipment as needed and its utilization should also monitor regularly.
- Basic occupational health and safety service and periodic training is compulsory to the workers especially those who work in the rural part of the plantation on the significant factors of work related injuries.
- The company employment policy provides higher emphasis for educational status.
- The OHS policy of the company penalizes workers who were entered to work station after intoxicated by alcohol or Khat.
- The company promotes marriage for the single workers.

To Workers

- The workers are volunteered to cooperate and followed the factory's working rule and occupational health and safety management system.
- Use personal protective equipment properly.
- Report injury events when it occurs.

To Afar region Bureau of people organization, labour and social affairs

- The bureau designed a strategy to conduct periodic work place occupational health and safety inspection as per the FDRE labour proclamation No_377/03.

To researchers

- Further study on mix of method is also recommended.

9. References

1. Aderaw Z. TT, Engdaw D.,. Determinant of occupational injury: A case control study among Textile factory workers in Amhara Regional state. Ethiopia journal of tropical medicine. 2011; 8.

2. Rogers B. W.B. Roles of occupational health nurse , in . Occupational nurse concept and practice. Saundars co. 1994: P48-64.

3. M. FLaA. Roles of occupational health nurse Occupational health and safety and the poorest school development studies 2011:10.

4. lK. M. Factors of importance of employee health organization production ,. Karolinska institute. 2010:9.

5. ILO. Global estimates of fatal and non fatal accidents and diseases. world congress on safety and health at work. 2011;XIX(Istanbul , Turkey) Dec.24/2013G.C, 5.22Pm.

6. ILO. Tripartite meeting on the construction industry in the 21st century. Its image employment prospect and skill requirements Geneva, 2001 Dec.24/2013G.C, 5.22Pm.

7. ILO. XVIIth world congress on safety and health at work Decent work Orland Sept, 2005: P5-13 Dec.24/2013G.C, 5.22Pm.

8. ILO. Safety and health in agriculture. Switzerland: Safework ILO; may 2000 Dec.24/2013G.C, 5.22Pm.

9. Wellman H LB. Occupational injuries in a commune in rural Vietnam transitioning from agriculture to new industries. AJPH,. may 2011;Vol101:5.

10. FDRE MOFED. Growth and transformation plan 2010/2011 – 2014/15, . Addis AbabaNov. 2010.

11. H. X. Agricultural work related injuries among farmers in Hubei, People's republic China. AJPH. August 2000;Vol 90:8.

12. agriculture Usdo. 2009 work related injuries to adults on farms. NASS. may 30/2013;Vol1:1 -2

13. USDOL. Employer reported work place injuries and illnesses, USA , . BLS. Nov 7/2013 Dec.25/2013G.C, 9.35Pm.

.

14. USDOL. Child labour in sugarcane industry in Paraguay. BLS. USA, Washington DC, 2011 480 Dec.26/2013G.C, 8.22Pm.

15. Behzadi M. . Musculoskeletal problems among workers of an Iranian sugar producing factory ,. JOSE 2009, ;Vol.5,(No_4):419 -24.

16. M. A. Occupational health, safety & ergonomic issues in small and medium sized enterprises in developing countries,. Jose. (ISBN951-42-6812-1):8.

17. Munir A AM. Ergonomics and occupational health in sugar industry of Pakistan,. PakJLife socSc. (2012), ;10(1)::74 – 9.

18. Abas A SM, Mohammed A, . Fatal occupational injuries among non Governmental employees in Malaysia. AJIM. 2013:8.

19. Santana S LD. Informal jobs and non fatal occupational injuries. Ann occup Hyg 2004;48(2)::147 - 57.

20. Tadesse T KA. Prevalence and factor work and work related injury among small and medium scale industries in North Gondar Zone, Amhara Region, Ethiopia,. EJHD. 2007;2;(1):6-8.

21. Yeha O. KA, Afar Regional State,. Assessment of occupational injuries in tendaho agricultural development S.C.,. EJHD,. 2007;24(3).

22. Finnish institute of occupational health system for collection and analysis of occupational accident data African newsletter on occupational health and safety. 2009;:4-5.

23. HM. K. Job safety analysis: A practical tool for ensuring safety of the workplace African newsletter on occupational health and safety. 2008:36-7.

24. Naomi.J DKaDAWsDolai. Prioritizing industries for occupational injury and Illness prevention and research , Washington state workers' compensation claims data, 2002 – 2010,. SHARP,. April 2013.

25. Asad R. JS, Iqbal S, . Effect of industrial environment on health status of workers , A case of Noon sugar mill Bhalwal, Pakistan. JSavap,. January 2013 ,; Vol4, No_1.

26. Sharma R. SR. Gender differences in prevalence of ergonomic stressors and upper extremities musculoskeletal problems in sugar industry workers, India. IJESM,. Dec.2011.

27. Smith P MC. Examining the associations between physical work demand and work injury rates between men and women in Ontario. Occup Environ Med;: . . 2004;61:750 – 6.

28. A. J. A case control study among carpet thread factory workers, Occupational injury and its Deteriorating factors, in Uttar Pradesh, India Global journal of Human social science. . 2012; (12 (10)).

29. Al-Rubaee F A-MA. Work related injuries in an oil field in Oman.

30. Y. H. Assessment of magnitude and factors of occupational injury among workers in large scale metal manufacturing industries in Addis Ababa, AAU. EJHD. 2010.

31. Tendaho sugar factory establishment council of ministers regulation no_122/2006, (February 17th 2006,).

10. Annexes

Annex -1 - Information sheet and consent form (English version)

Title of the Research

Work related injuries and associated factors among Tendaho sugarcane plantation workers in Afar region, Ethiopia, 2014.

Name of Principal Investigator: Dejene Tessema Abtew

Name of the Organization: University of Gondar, Gondar College of Medicine and Health Sciences, Institute of Public Health.

Name of the Sponsor: Afar National Regional State Bureau of People Organization, Labour and Social Affairs.

Introduction

This information sheet and consent form is prepared with the aim of assessing prevalence and factors associated with work related injuries among Tendaho sugarcane plantation workers , in Aysaita, Dubti and Detbahri town, Afar region, Ethiopia. The research group includes the principal investigator, six trained data collectors, two Supervisor, and two advisors from University of Gondar.

Purpose of the Research Project

The aim of this study is to assess the prevalence and factors associated with work related injuries among workers of Tendaho sugarcane plantation. Assessing the prevalence and factors associated with work related injuries is very important to reduce workers morbidity and mortality from accidents and injuries, reduce absenteeism of workers and increase productivity of the undertaking. The results of this study will be used to design appropriate intervention programs to address the problems related to work related injuries in Afar region, Ethiopia.

Procedure - The study involves workers who are working for Tendaho sugarcane plantation from July1 /2013 to July 30/2014. You are selected to be one of the study

participants if you are willing to take part in this study and we kindly invite you to take part in our project. If you are willing to participate, I need you to clearly understand the aim of this study and show your agreement .Finally you are kindly requested to give your genuine response in the interview.

Benefits, Risk and /or Discomfort

By participating in this research project you may feel some discomfort in wasting your time (a maximum of 15 minutes). However, your participation is definitely important to identify the prevalence and factors associated with work related injuries, to design appropriate strategy & to improve occupational health services in sugarcane plantations. There is no risk or benefit in participating in this research project.

Incentives/Payments for Participating

You will not be provided any incentives or payment to take part in this project.

Confidentiality

The information collected from you will be kept confidential and stored in a file, without your name by assigning a code number to it. Hence, no report of the study ever identifies you.

Right to Refusal or Withdraw

You have full right to refuse from participating in this research. You have also the full right to withdraw from this study at any time you wish.

Person to contact

This research project will be reviewed and approved by the ethical committee of the University of Gondar. If you have any question you can contact any of the following individuals and you may ask at any time you want.

1. Name: Dejene Tessema
   Tele: +251-912024626
   E-mail:dejenetesema176@gmail.com
2. Name: Bikes Destaw
   Tele: +251-918785876
   E-mail:bikesdestaw2004@gmail.com
3. Name: Getahun Kebede
   Tele: +251-913379518
   E-mail: getkoo@yahoo.com

Annex - 2 - Information sheet and consent form (Amharic version)

በአፋር ብሔራዊ ክልል የተንደሆ ሸንኮር አገዳ እርሻ ሰራተኞች ላይ የሚደርሰውን የስራ ላይ አደጋ መጠንና ምንጭ ለማጥናት የሚደረግ ምርምር ማብራሪያና ለተሳታፊዎች መግለጫ የተዘጋጀ መግለጫ ነው፡፡

1. የጥናቱ ዓላማ -በተንደሆ የሸንኮር አገዳ እርሻ ሰራተኞች ላይ የሚደርሰውን የስራ ላይ አደጋ መጠንና ምንጭ መዳሰስ
2. **የተሳትፎ ሁኔታ**

በዚህ ጥናት ውስጥ ለመሳተፍ ከተሰማሙ ስምምነቱን መረዳትና እንዲሁም መፈረም ይገባዎትል፡፡ በዚህ ጥናተ ሲሳተፉ መረጃ ሰብሳቢው የሚጠይቀዎትነ ጥየቄ እንደመልሱ ፈቃደኛነት ይጠይቃል፡፡ የሚሰጡት መልስም ሆነ ውጤቱ በሚስጥር ይጠበቃል፡፡

3. የጥናቱ አባላት - 1 ዋና ተመራማሪ፣ 6 የሠለጠኑ መረጃ ሰብሳቢዎችን፣ 2 ተቆጣጣሪዎችንንና 2 አማካሪዎች ከጎንደር ዩኒቨርሲቲ ያካትታል፡፡
4. ሊከሰቱ የሚችሉ ስጋቶችና የምቾት መጓደሎች

በዚህ ጥናት መሳተፍ ምናልባት ጊዜን ሊሻማበዎት ይችል ይሆናል፡፡ ነገር ግን ሌላ ምንም ችግር የለውም፡፡

በዚ ጥናት በመሳተፍ ምንም አይነት ስጋት /ችግር/ አያጋጥሞትም፡፡

5. **ጥቅሞች**

በዚህ ጥናት በመሳተፍ የተለየ ጥቅም አያገኙም፡፡ ነገር ግን የእርስዎ በጥናቱ መሳተፍ በስራ ቦታ በማያጋጥሙ አደጋዎች ዙሪያ ለሚደረጉ የቁጥጥርና የመከላከል እርምጃዎች ያለው ጠቀሜታ እጅግ በጣም ከፍተኛ ነው፡፡

ማካካሻ - በዚህ ጥናት በመሳተፍ ምንም አይነት ማካካሻ እይሰጠዎትም፡፡ ነገር ግን በጥናቱ በመሳተፍዎ ምስጋናችን ከፍ ያለ ነው፡፡

6. **ምስጢር ስለ-መጠበቅ**

የሚሰጡትን መልስ እንዲሁም የጥናት ውጤት በሚስጥራዊነት ይጠበቃል፡፡ ለዚህ ጥናት የሚሰበሰው እርስዎን የሚመለከት መረጃ ከዋናው ተመራማሪ በስተቀር ለማንም አይገለፅም፡፡ በጥናቱ ላለመሳተፍ ከፈለጉ በዚህ ጥናት ያለመሳተፍ ወይም ከአንድ በላይ እንዲሁም ሁሉንም ጥያቄዎች ያለመመለስ ይችላሉ፡፡ በዚህ ጥናት ባለመሳተፍ ወይም በከፈልም ሆነ በሙሉ ጥያቄችን ባለመመለስ የሚያጡት ህክምና ወይም የጤና አገልግሎት አይኖርም

7. የበለጠ መረጃ ለማግኘትና ለማንኛውም ጥያቄ አቶ ደጀኔ ተሠማን በአካል ወይም በስልክ ቁጥር 0912024626 ማነጋገር ወይም በኢሜል - dejenetesema176@gmail.com መልዕክት መላክ ይችላሉ፡፡

Annex - 3- Questionnaire and consent form (English version)

UNIVERSITY OF GONDAR

COLLEGE OF MEDICINE AND HEALTH SCINCES

INSTITUTE OF PUBLIC HEALTH

Work related injuries and associated factors among Tendaho sugarcane plantation workers in afar region, Ethiopia.

Introduction:

My name is----------,I am working for the Research to be conducted by Ato Dejene Tessema for his Master of Public Health on prevalence and factors associated with work related injuries among workers this company. The purpose of this questionnaire is to gather information on work related injury status and factors associated with it. The results of the study are important for designing appropriate interventions for the improvement of working conditions and prevent work related injuries among workers in sugar factory workers in general.

I will ask you some questions which will take few minutes. The answer to be provided for the questions will remain confidential. We will not write your name in the questionnaire. You can refuse to respond to any of the questions and you can interrupt at any of the point in the interview. Your role in the success of the research is immense and we appreciate your contribution to the research.

I have been explained about the advantage of the research and the roles I will have in the research. I have agreed to participate in the study.

A. yes---------- B. No----------Continue the interview if the respondent says" yes '' and thank and stop here if the respondent says" no" Signature of respondent_____ Date of data collection----------Name of the data collector----------

Questionnaires identification number----------

Section – one – Socio-demographic information

No	Question	Possible Response	Skipping	Code
101	Sex	1. Female 2.Male		
102	Age	----------		
103	What is your marital status?	1.Single 2. Married 3.Widowed 4. Divorced		
104	Religion	1.Orthodox 3.Protestant 2.Catholic 4.Musilm 5.others specify ----------		
105	Educational level	1. Illiterate 2. Primary school(1 – 8) 3. Secondary school (9-12) 4.Graduated from TEVTcollege 5. others specify ------		
106	What is your employment type?	1. Permanent 2. Temporary 3. Other specify ----		
107	Ethnicity	1. Amhara 2. Tigrai 3. Oromo 4. SNNPR 5. Afar 6. Others----------		
108	Work experience?	----------years/months/days		
109	Daily or monthly salary?	----------Birr		
110	Area of Residences?	1. Urban 2. Rural		
111	Working department?	----------		

Section – two – Work related injury characteristics

No	Questions	Possible responses	Skipping	code
201	Have you had an incident at job that resulted in an injury to you in the last 12 months ?	1. Yes 2. No		
202	Have you had an incident at job that resulted in an injury to you in the last two weeks?	1. Yes 2. No		
203	If Yes for Q201 or Q202, how many times?	1.---------in 12 months 2.--------in 2 weeks		
204	Parts of the body affected	1. Eye 1.Yes 2.No 2. Tooth 1.Yes 2.No 3. Hand 1.Yes 2.No 4. Ear 1.Yes 2.No 5. Knee 1.Yes 2.No 6. Toe 1.Yes 2.No 7. Finger 1.Yes 2.No 8. Head 1.Yes 2.No 9.Upper Arm 1.Yes 2.No 10.Lower Arm 1.Yes 2.No 11.Upper Leg 1.Yes 2.No 12. Lower Leg 1.Yes 2.No 13. Back 1.Yes 2.No 14. Chest 1.Yes 2.No 15.Multilocation 1.Yes 2.No 16. other specify-----		

No	Questions	Possible responses	Skipping	code
205	Types of Injury?	1. Abrasion 1.Yes 2.No 2. Cut 1.Yes 2.No 3. Burn 1.Yes 2.No 4. Puncture 1.Yes 2.No 5. Fracture 1.Yes 2.No 6. Dislocation 1.Yes 2.No 7. Eye injury 1.Yes 2.No 8. Ear injury 1.Yes 2.No 9. Suffocation 1.Yes 2.No 10. Electrocutions 1.Yes 2.No 11. Amputation 1.Yes 2.No 12. Poisoning 1.Yes 2.No 13. Other, specify_____		
206	What were you doing at the time of injury?	----------		
207	Sources of injury	1. Machinery 1.Yes 2.No 2. Hit by Falling objects 1. Yes 2.No 3. Electricity 1.Yes 2.No 4. Splintering objects 1. Yes 2.No 5. Hand tools 1.Yes 2.No 6. Fire 1.Yes 2.No 7. Acids and hot substances 1.Yes 2.No 8. Falls 1.Yes 2.No 9. Collision with objects 1.Yes 2.No 10. Lifting heavy objects 1.Yes 2.No 11. Other, specify_____		
208	Days of injury(encircle the answer	1.Monday 2.Tuesday 3. Wednesday 4.Thursday 5.Friday 6.Saturday 7.Sunday		

No	Questions	Possible responses	Skipping	code
209	Time of injury	1.In the morning 1.Yes 2.No 2.In the Afternoon 1.Yes 2.No 3.In the evening 1.Yes 2.No 4. In the midnight 1.Yes 2.No		
210	Were you hospitalized as result of injury in the last 12 month	1. Yes 2. No		
211	If Yes Q. 210, for how long	1. less than 24 hrs 2.more than 24 hrs		
212	Number of days lost due to injury at work last one year (in days)	----------		

Section – three - Work environment information

No-	Question	Possible response	Skipping	Codes
301	Hours worked per week	----------		
302	Workplace regularly supervised	1.Yes 2.No		
303	Have you had any safety training in connection with new employment, new equipment or other Changes?	1.Yes 2.No		
304	How long since your last training/education	---------- days/months/years		
305	Do you have periodical medical checkup?	1. Yes 2. No		
306	If your answer for Q304 Yes, How frequent?	1.Every three months 2.Every six months 3.Every year 4,Other pattern, specify----------		

Section – 4 – Workers behavioral characteristics

No	Question	Possible responses	Skipping	code
401	Do you smoke?	1. Yes 2. No		
402	If your answer for Q401 is Yes, how often?	1. Every day 2. 1-3 days/week 3. Occasionally		
403	Do you drink alcohol?	1. Yes 2. NO		
404	If your answer for Q403 is Yes, how often?	1. Every day 2. 1-3 days/week 3. Occasionally		
405	Do you chew khat?	1. Yes 2. NO		
406	If your answer for Q405 is Yes, how often?	1. Every day 2. 1-3 days/week 3. Occasionally		
407	Do you have any sleeping disorders?	1. Yes 2. No		
408	If your answer for Q407 is Yes, what is your reason?	1. Working greater than 8hr without shifting 2. Working in evening 3. Trying to work more than one task at a time 4. Others, specify-------		
409	Are you satisfied with your job?	1. Yes 2. No		
410	Do you use any personal protective device while you are working?	1. Yes 2. No	No skip to Q412	

No	Question	Possible responses	Skipping	code
411	If yes, for Q410, what type?	1.Gloves 1.Yes 2.No 2.Ear plug 1.Yes 2.No 3.Respirators 1.Yes 2.No 4.Helmet 1.Yes 2.No 5.Overalls 1.Yes 2.No 6.Goggles 1.Yes 2.No 7. Face shield 1.Yes 2.No 8. Boots 1.Yes 2.No 9.Others, specify____		
412	What are your reasons for not using personal protective equipment?	1. Lack of protective equipment. 2. Lack of safety and health education. 3.Not comfortable to use 4.Decrease work performance 5.Create safety and health hazards 6.Other, specify_____		

This is the end of our questionnaire .We thank you very much for taking time to respond these questions. We appreciate your cooperation

Annex- 4 - Questionnaire and consent form (Amharic version)

ጎንደር ዩኒቨርሲቲ

ሕክምናና ጤና ሳይንስ ኮሌጅ

ይህ መጠይቅ በአፋር ብሔራዊ ክልል በተንደሆ ስኳር ፋብሪካ የሸንኮራ አገዳ እርሻ ውስጥ የሚሰሩ ሰራተኞች የሚደርስባቸውን የስራ ላይ አደጋ መጠን እና ምክንያቱን ለመለየት ለሚካሄድ ጥናት የተዘጋጀ ነው፡፡ መጋቢት 2006 ዓ.ም

የመጠየቂያ ቅፅ መለያ ቁጥር ----------

መግቢያ ፡

እኔ ---------- እባላለሁ ፡፡ በጎንደር ዩኒቨርስቲ የህብረተሰብ ጤና አጠባበቅ ትምህርት ተቋም አቶ ደጀኔ ተሠማ በህብረተሰብ ጤና ለሁለተኛ ዲግሪ በሚያካሂዱት ጥናት በመረጃ ሰብሳቢነት የምሰራ ነኝ ፡፡

የዚህ ጥናት ዋና አላማ በሸንኮራ አገዳ እርሻ ሰራተኞች ላይ የሚያጋጥሙ የስራ ላይ አደጋዎች ለመለየትና ምክንያታቸውን ለማጥናት የተዘጋጀ ነዉ፡፡ ለዚህም ይረዳ ዘንድ ጥያቀዎችን እንጠይቆዎታለን፡፡

በመጠይቁ የግል ባህርያት የተመለከቱ ጥያቄዎች እጠይቆታለሁ ይሁንና ስምዎም ሆነ ሌሎች የእርስዎን ማንነት የሚገልጹ ነገሮችን አይመዘገብም፡፡ በተጨማሪ በመጠይቁ ወቅት መመለስ የማይፈልጉትን ማንኛዉንም አይነት ጥያቄ መተዉ ወይም በማንኛዉም ሰአት ማቋረጥ ይችላሉ ፡፡ መጠየቁ ከ20 እስከ 30 ደቂቃ ሊወስድ ይችላል ስለዚህ በዚህ ጥናት ላይ መሳተፍ ይፈልጋሉ ? 1. አዎ 2. የለም

መልሱ አዎን ከሆነ ወደሚቀጥለው ንዕስ ክፍል እለፍ

የለም ከሆነ አመሰግነህ መጥይቁን አቋርጥ

መልሱን የሚሠጡት ሰው ፈርማ ----------

መጠየቅ ያደረገው ሰው ስም ---------- ፊርማ ----------

መጠይቁ የተሞላበት ቀን ----------

መመሪያ፡ ለሚከተሉት ጥያቄዎች በተሰጠው ክፍት ቦታ ወይም ከተዘረዘሩት ምርጫዎች ተጠያቂዎች የተሰጡትን መልስ ፃፍ ወይም ቁጥሩን ብቻ ምርጥ ፡፡

የቃለ መጠይቁ መለያ ቁጥር----------

የመጀመሪያ ክፍል፡- የሥነ ሕዝብና ማህበራዊ ባሕሪያትን የተመለከተ

ቁጥር	ጥያቄ	የሚጠበቁ ምላሾች	የሚዘለሉ	ኮድ
101	ፆታ	1. ሴት 2. ወንድ		
102	እድሜ	----------ዓመት		
103	የጋብቻ ሁኔታ	1.ያገባ 2. ያላገባ 1. የፈታ/ች/ 4. የሞተበት/ባት/		
104	**ሀይማኖት**	1. ኦርቶዶክስ ክርስቲያን 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ ይገለፅ		
105	የትምህርት ደረጃ	1. ያልተማረ/ች/ 2. ማንበብና መጻፍ የሚችል 3. የመጀመሪያ ደረጃ ትምህርት /ከ1ኛ-8ኛ ክፍል/ 4. ከ9ኛ ክፍል - ከ12ኛ ክፍል በላይ 5. ቴክኒክና ሙያ ትምህርት ያጠናቀቀ/ች 6. ሌላ ይገለጽ ----------		
106	የቅጥር አይነት	1. ጊዜያዊ 2. ቋሚ 3. ሌላ ካለ ይገለጽ		
107	ብሔር	1. አማራ 2. ትግሬ 3.ኦሮሞ 4. ደቡብ ብ/ብ/ህ/ክልል 5.አፋር 6. ሌላ ይገለፅ----------		
108	አሁን በሚሰሩት ስራ ላይ ያለዎት የስራ ልምድ	----------		
109	ወርሃዊ/ የቀን ክፍያ /ደመወዝህ/ዎ	----------		
110	የመኖሪያ አካባቢ	1. ከተማ 2. ገጠር		
111	የስራ ክፍል	----------		

ክፍል ሁለት - የስራ ላይ ጉዳትን የተመለከተ

ቁጥር	ጥያቄ	የሚጠበቁ ምላሾች	የሚዘለሉ	ኮድ
201	ባለፉት 12 ወራት ውስጥ ከስራዎ ጋር በተያያዘ የደረሰበዎት አደጋ አለ?	1. አዎ 2. የለም		
202	ባለፉት 2 ሳምንታት ውስጥ ከስራዎ ጋር በተያያዘ የደረሰበዎት አደጋ አለ?	1. አዎ 2. የለም		
203	ለጥያቄ ቁ.201 እና 202 መልሰዎ አዎ ከሆነ ለስንት ጊዜ?	1. ባለፉት 12 ወራት 2. ባለፋት 2 ሳምንታት		
204	ጉዳት የደረሰበት የሰውነት ክፍል	1. አይን 1. አዎ 2. የለም 2. ጥርስ 1. አዎ 2. የለም 3. እጅ 1. አዎ 2. የለም 4. ጆሮ 1. አዎ 2. የለም 5. ጉልበት 1. አዎ 2. የለም 6. እግር 1. አዎ 2. የለም 7. የእግር ጣት 1. አዎ 2. የለም 8. ራስ 1. አዎ 2. የለም 9. የላይኛው ክንድ 1. አዎ 2. የለም 10. የታችኛው ክንድ 1. አዎ 2. የለም 11. ከጉልበት በላይ 1. አዎ 2. የለም 12. ከጉልበት በታች 1. አዎ 2. የለም 13. ጀርባ 1. አዎ 2. የለም 14. ደረት 1. አዎ 2. የለም 15. የተለያየ የሰውነት ክፍል ላይ 1. አዎ 2. የለም 16. ሌላ ካለ ይገለፅ -------		
205	የጉዳት ዓይነት	1. ጭረት/መላጥ 1. አዎ 2. የለም 2. መቆረጥ 1. አዎ 2. የለም 3. ቃጠሎ 1. አዎ 2. የለም 4. መወጋት 1. አዎ 2. የለም 5. ስብራት 1. አዎ 2. የለም		

ቁጥር	ጥያቄ	የሚጠበቁ ምላሾች	የሚዘለሉ	ኮድ
		6. ወለምታ 1. አዎ 2. የለም 7. ተቆርጦ መውደቅ 1. አዎ 2. የለም 8. በኤሌክትሪክ መያዝ 1. አዎ 2. የለም 9. መታፈን 1. አዎ 2. የለም 10. የጆሮ ጉዳት 1. አዎ 2. የለም 11. የአይን ጉዳት 1. አዎ 2. የለም 12. መመረዝ 1. አዎ 2. የለም 13. ሌላ ካለ ይግለፁ----------		
206	አደጋው ሲደርስ ምን ያደርጉ ነበር	----------		
207	የጉዳቱ መንስኤ ምን ነበር	1. ማሽን 1. አዎ 2. የለም 2. የሚወድቁ ነገሮች 1. አዎ 2. የለም 3. ኤሌክትሪክ 1. አዎ 2. የለም 4. የሚፈናጠሩ ነገሮች 1. አዎ 2. የለም 5. የዕጅ መሳሪያ 1. አዎ 2. የለም 6. ዕሳት 1. አዎ 2. የለም 7. አሲድና አሲዳማ ነገሮች 1. አዎ 2. የለም 8. መውደቅ 1. አዎ 2. የለም 9. ከዕቃ ጋር መጋጨት 1. አዎ 2. የለም 10. ከባድ ዕቃ ማንሳት 1. አዎ 2. የለም 11. ሌላ ካለ ይጥቀሱ ----------		
208	ጉዳቱ ያጋጠመበዎ ቀን	1. ሠኞ 2. ማክሰኞ 3.ረቡዕ 4. ሐሙስ 5. አርብ 6. ቅዳሜ 7. እሁድ		
209	ጉዳቱ የደረሰበት ሰዓት	1. ጠዋት 1. አዎ 2. የለም 2. ከሠዓት በኋላ 1. አዎ 2. የለም 3. ምሽት 1. አዎ 2. የለም 4. ሌሊት 1. አዎ 2. የለም		
210	ባለፉት 12 ወራት በስራ ላይ አደጋ የተነሳ ተኝተው ያውቃሉ	1. አዎ 2. የለም		

211	ለጥያቄ ቁ.210 መልስዎ አዎ ከሆነ፣ ለምን ያህል ጊዜ	1. ከ24 ሠዓት በታች 2. ከ24 ሠዓት በላይ		
212	ባለፉት 12 ወራት በስራ ላይ አደጋ የተነሳ የባከነ የስራ ጊዜ	----------		

ክፍል 3 - የስራ አካባቢን በተመለከተ

ቁጥር	ጥያቄ	የሚጠበቁ ምላሾች	የሚዘለሉ	ኮድ
301	ሣምንታዊ የስራ ሰዓትዎ ስንት ነው	----------		
302	መደበኛ የሙያ ጤንነትና ደህንነት ቁጥጥር ይደረጋል	1. አዎ 2. የለም		
303	አዲስ ቅጥር ሲከናወን፣ አዲስ መሳሪያ ሲገጠም ወይም በሌላ ለውጥ የሙያ ጤንነትና ደህንነት ስልጠና ወስደው ያውቃሉ	1. አዎ 2. የለም		
304	ስልጠናውን ከወሰዱ ምን ያህል ጊዜ ሆነዎት	----------ቀን/ወራት/ዓመታት		
305	ወቅታዊ የጤና ምርመራ ተደርጎለዎት ያውቃል	1. አዎ 2. የለም		
306	ለጥያቄ ቁ.304 መልሰዎ አዎ ከሆነ፣ በምን ያህል የጊዜ ልዩነት ይደረግለዎታል	1. በየ3 ወሩ 2. በየ 6 ወሩ 3. በየ ዓመቱ 4. ሌላ ካለ ይጥቀሱ		

ክፍል 4 የሠራተኞችን ባህሪ በተበመለከተ

ቁጥር	ጥያቄ	የሚጠበቁ ምላሾች	የሚዘለሉ	ኮድ
401	ያጨሳሉ	1. አዎ 2. የለም		
402	ለጥያቄ ቁ.401 መልሰዎ አዎ ከሆነ በስንት ጊዜ	1.በየ ቀኑ 2. በሳምነተ ከ እስከ 3 ቀን 3. አልፎ አልፎ		
403	አልኮል ይጠጣሉ	1. አዎ 2. የለም		
404	ለጥያቄ ቁ.403 መልሰዎ አዎ ከሆነ በስንት ጊዜ	1.በየ ቀኑ 2. በሳምነተ ከ እስከ 3 ቀን 3. አልፎ አልፎ		
405	ጫት ይቅማሉ	2. አዎ 2. የለም		
406	ለጥያቄ ቁ.405 መልሰዎ አዎ ከሆነ በስንት ጊዜ	1.በየ ቀኑ 2. በሳምነተ ከ እስከ 3 ቀን 3. አልፎ አልፎ		
407	በስራ ላይ እያሉ የእንቅልፍ ችግር አለበዎት	1. አዎ 2. የለም		
408	ለጥያቄ ቁ.407 መልሰዎ አዎ ከሆነ፣ ምክንያቱ ምንድን ነው	1. ያለ እረፍት ከ8ሠዓት በላይ መስራት 2. በምሽት መስራት 3. በአንድ ጊዜ ከአንድ በላይ ስራ መስራት 4. ሌላ ካለ ይጠቀስ----------		
409	በስራዎ ደስተኛ ነዎት	1. አዎ 2. የለም		
410	በስራ ቦታዎ የስራ ላይ አደጋ መከላከያ መሳሪያዎችን ይጠቀማሉ	1. አዎ 2. የለም		
411	ለጥያቄ ቁ410 መልሰዎ አዎ ከሆነ ምን ዓይነት	1.ጓንት 1. አዎ 2. የለም 2.የጆሮ መከላከያ 1. አዎ 2. የለም 3.የአፍና የአፍንጫ መከላከያ 1. አዎ 2. የለም 4.የጭንቅላት መከላከያ 1. አዎ 2. የለም 5.ሁሉንም የሰውነት ክፍል የሚሸፍን 1. አዎ 2. የለም 6.የአይን መከላከያ መነፀር 1. አዎ 2. የለም		

		7.የፊት መሸፈኛ 1. አዎ 2. የለም 8. ቦቲ ጫማ 1. አዎ 2. የለም 9. ሌላ ካለ ይግለፁ----------		
412	ለጥያቄ ቁጥር 410 መልሰዎ የለም ከሆነ ምክንያተዎ ምንድን ነው	1. የመከላከያ መሳሪያዎች ባለመኖራቸው 2. ስለጠቀሜታው ስልጠና ስለማይሰጥ 3. ለአጠቃቀም ስለማይመች 4. የስራ ቅልጥፍናን ስለሚቀንስ 5. ሌላ የሙያ ጤንነትና ደህንነት ጠንቅ ስለሚፈጥር 6. ሌላ ካለ ይግለፁ----------		

ይህ የመጠይቃችን መጨረሻ ነው:: እነዚህን ጥያቄዎች ጊዜ ወስደው በመመለስ ላደረጉልን ትብብር ከልብ እናመሰግናለን፡

Annex - 5 - Check list for observation of working environment

UNIVERSITY OF GONDAR

COLLEGE OF MEDICINE AND HEALTH SCIENCES

INSTITUTE OF PUBLIC HEALTH

CHECK LIST FOR OBSERVATION OF WORKING ENVIRONMENT IN TENDAHO SUGARCANE PLANTATION, AFAR REGION. ETHIOPIA

Check list Identification No. ----------

Name of the Department ----------

Major hazardous operation in the work----------

Major focus duties of the work----------

Total number of employee directly employed in the Dep't -------- M, ------- F---------- Total

Hazards in Working Environment

1. Is there excessive heat in the work place? 1.Yes 2.No.A yes requires that a worker is found sweating when naked or with light clothing if investigator feels are sudden heat wave when in to the sites
2. s there excessive dust in the work place? 1.Yes 2.No A yes requires if the investigator experiences sudden sneezing upon entering the work place or if the workers eye brows, hair, and nostrils and clothes are observed by investigator to be covered with dust particles
3. Is there excessive noise in the work place? 1. Yes 2.No. A yes requires that it is difficult to communicate with nearby worker without shouting
4. Is there warning signs or safety rules ?1.Yes 2.No.A yes requires no lack of such arrangement at inspection around
5. Does the employee use the necessary personal protective equipment? 1. Yes 2.No. A yes requires no lack in the use of safety devices seen during inspection around
6. Do all work equipments have the appropriate protective arrangement? 1. Yes 2.No. A yes requires no lack of such arrangement(poorly installed electric-wire or unguarded machine or equipment)at inspection around
7. What is the most dangerous incident in the site during the last 12 months, and any preventive measures been implemented? 1. Yes 2. Attainment of yes requires specification of the incident and preventive measures

8. Does the site have copy of the most important safety and health regulations? 1. Yes 2.No.A yes requires a copy of the regulation
9. Does the site safety manager/personnel? 1.Yes 2.No. Attainment of yes requires either implementation as result of initiative from health and safety personnel or written program for action worked out with them
10. Does the site follow written health and safety plan for action in the workplace? 1.yes 2.No.A yes requires completion of at least one of at least one of the measures in the plan.
11. Does the site arrange meetings on regular basis to discuss health issues with the employee at least in the last six months 1,Yes 2.No. A yes requires minutes with written conclusion for the meeting held during the period specified.
12. Are training needs considered with new employment ,equipment or other changes on operation taking places in the site ?1,Yes 2.No. A yes requires sample of training given as consequence of the changes stated.
13. Does the site have the first aid service and equipment required for this? 1.Yes 2.No. A yes requires that the first aid equipment where the required standard equipment available in the working area of the site

These were our observation questions. We are very much grateful to you for giving us your precious time and appropriately responded for our queries

Annex – 6

Declaration

I, the undersigned, MPH student declare that this thesis report is my original work in partial fulfillment of the requirement for the degree of Master of Public health / MPH/.

Name: Dejene Tessema Abtew

Signature: _____

Place of submission: Institute of Public health, College of Medicine and Health Sciences, University of Gondar.

Date of Submission: ---------- 2014 G.C

This thesis report has been submitted for examination with my/our approval as university advisor(s).

Advisors

Name	Signature
Mr, Bikes Destaw	_____
Mr. Getahu Kebede	_____